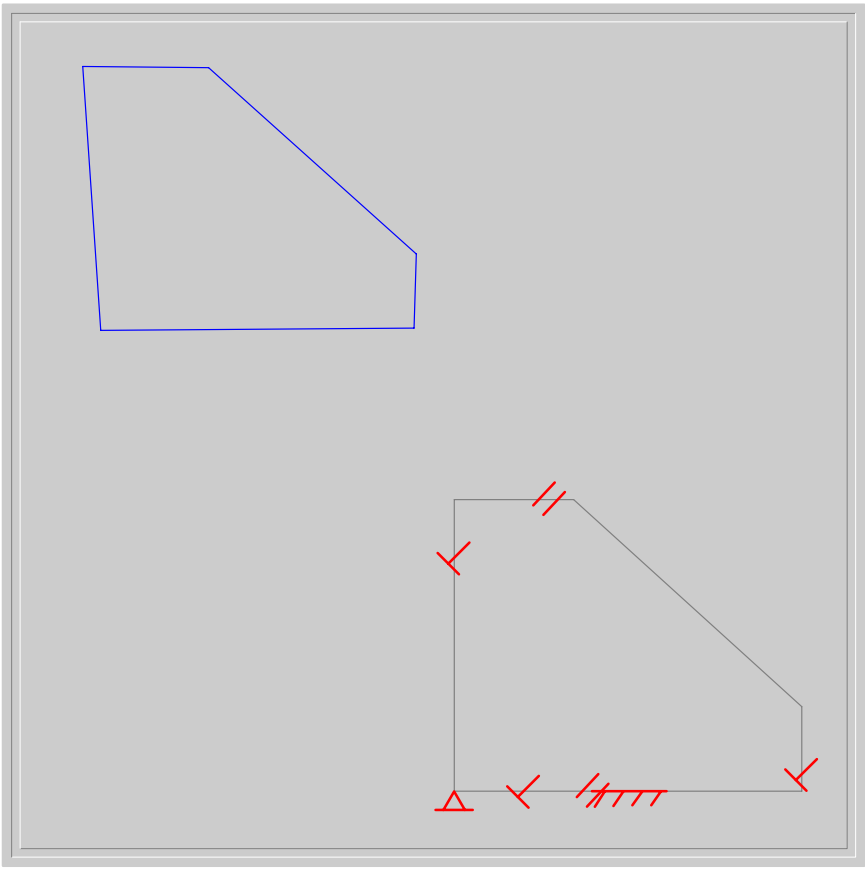


Sketching and Constraining

I-DEAS® Tutorials: Fundamental Skills

Learn how to:

- sketch using the Dynamic Navigator™
- create constraints

Before you begin...

Prerequisite tutorials:

- Getting Started (I-DEAS™ Multimedia Training)

  –or–

  Introducing the I-DEAS Interface,
  Quick Tips to Using I-DEAS
  –and–
  Creating Parts

If you didn't start I-DEAS with a new (empty) model file, open a new one now and give it a unique name.

File
Open

Open Model File form

Model File name: any unique name
OK

Make sure you're in the following application and task:

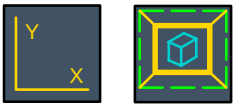
Design, *Manufacturing*, or *Simulation*
Modeler

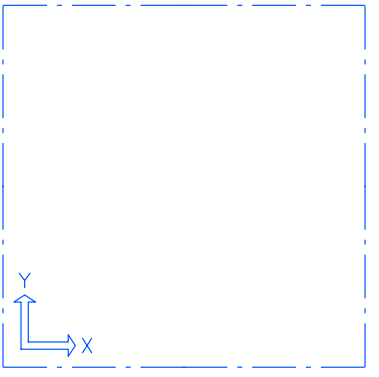
Set your units to mm.

Options
Units

mm (*milli newton*)

Select *Front View* and *Zoom All*





Save your model file.

File
Save

Warning!
If you are prompted by I-DEAS to save your model file, respond:

No

Save only when the tutorial instructions tell you to—not when I-DEAS prompts for a save.

If you make a mistake at any time between saves and can't recover, you can reopen your model file to the last save and start over from that point.

Hint
To reopen your model file to the previous save, press Control-z.

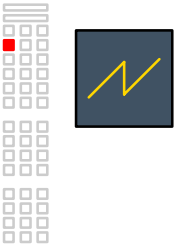
Sketch using the Dynamic Navigator 1 of 8

The Dynamic Navigator recognizes natural engineering relationships (e.g., parallel and perpendicular), and creates constraints to maintain these relationships when geometry or dimensions are changed.

You have used the Dynamic Navigator in previous tutorials. The next few pages show you in more detail how the Dynamic Navigator works.

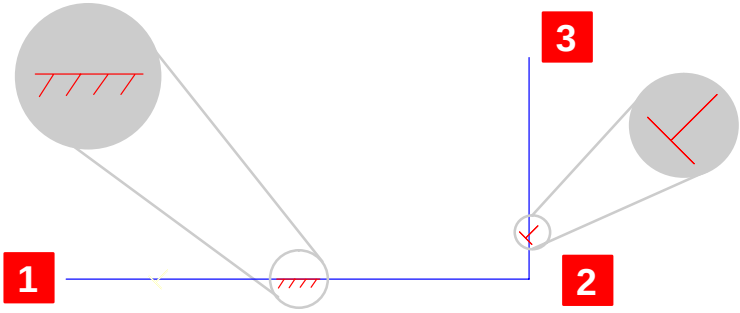
Sketch using the Dynamic Navigator 2 of 8

Select the *Polylines* icon.



Begin sketching horizontal and vertical lines as shown.

Don’t terminate the command after you sketch.

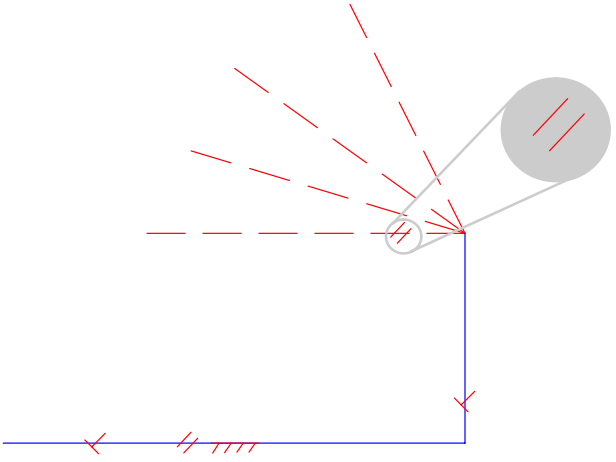


Things to notice

The first line snaps to horizontal, the second to perpendicular.

Sketch using the Dynamic Navigator 3 of 8

Without clicking on a fourth point, move the mouse up and down.



Things to notice

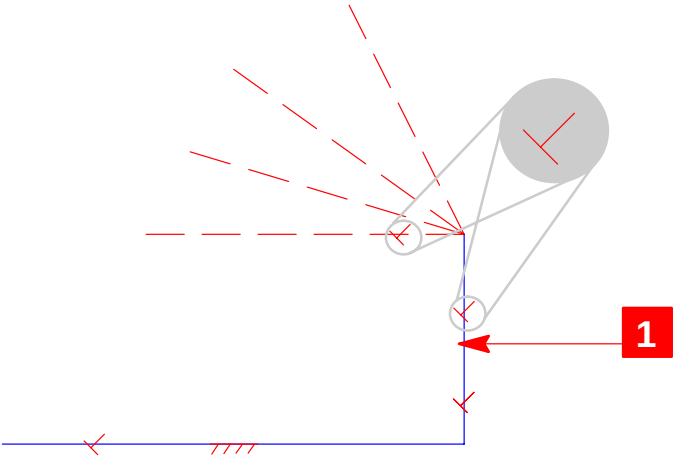
Notice how the software snaps to horizontal and shows a parallel symbol (parallel to the first line sketched). The Dynamic Navigator's preference is to create constraints to the first geometry sketched.

You can use the *Focus* option to change this order of preference in creating constraints.

Focus

1 pick the vertical line

Move the mouse pointer up and down on the screen.



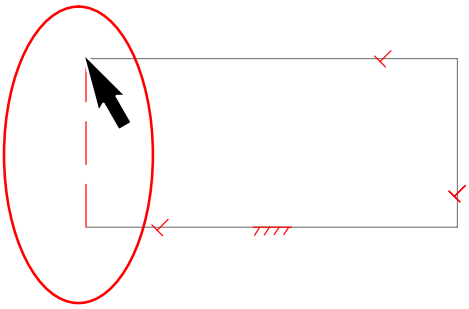
Things to notice

The software now focuses on the vertical line to create a perpendicular constraint instead.

Sketch using the Dynamic Navigator 5 of 8

When the cursor is above the first point, there is a dotted vertical projection line aligning the two points.

Move the cursor above the first point. Notice the dotted line.

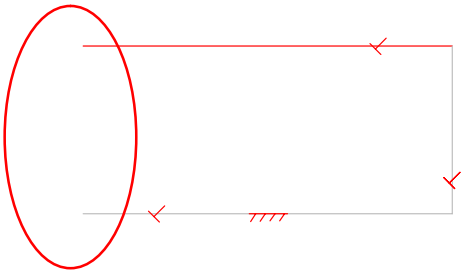


Turn off the *Align* option to disable this alignment.

Align

Check *I-DEAS List*.
Notice the message telling you *Align* is off.

Move the cursor over the first point and no dotted line appears.



Sketch using the Dynamic Navigator 6 of 8

You can use the options on the right mouse button menu to create an angle of specific degrees.

Options...

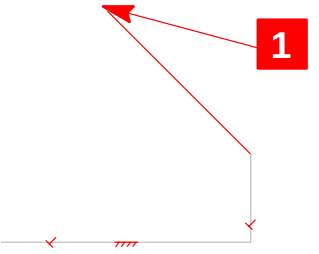
Line Creation Options form

Angle: 135

OK

---

1 click to complete the angled line



Clear the *Angle* field.

Options...

Line Creation Options form

Angle: (clear field using Backspace or Delete)

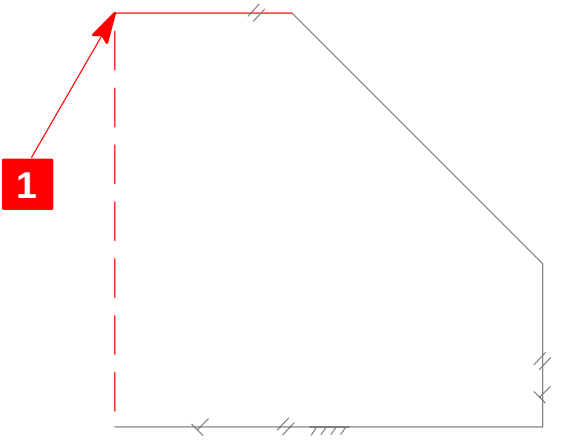
OK

Sketch using the Dynamic Navigator 7 of 8

Turn *Align* back on to create the next point aligned vertically with the starting point.

Align

1 click on the spot above starting point, parallel with the first line



Sketch using the Dynamic Navigator 8 of 8

You can also control the Dynamic Navigator constraints with the right mouse button menu.

Navigator...

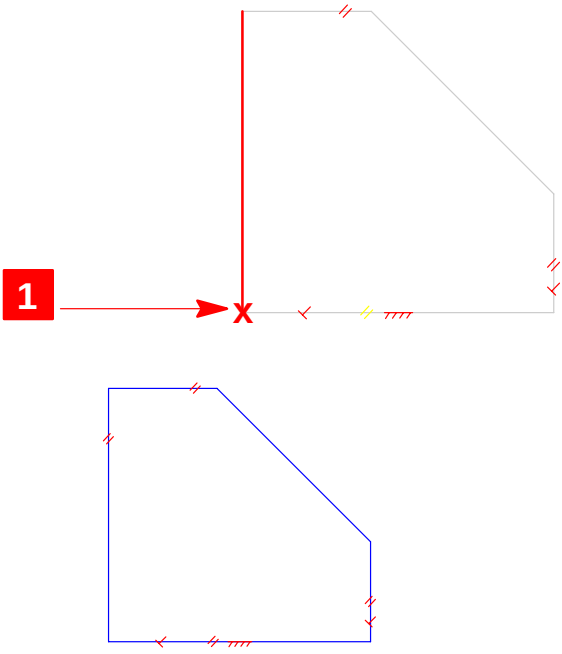
Navigator Controls form

Toggle on every *Recognize* and *Constrain* option, except:

Angular Dimension (toggle off if on)

OK

Complete the sketch by drawing the last line and clicking on your starting point when you see an x.



Constraints give you control over how your model incorporates your design intent.

As you just saw, the Dynamic Navigator adds constraints as you sketch. There may be times when you want to create your own constraints.

You can manually create the following constraints:

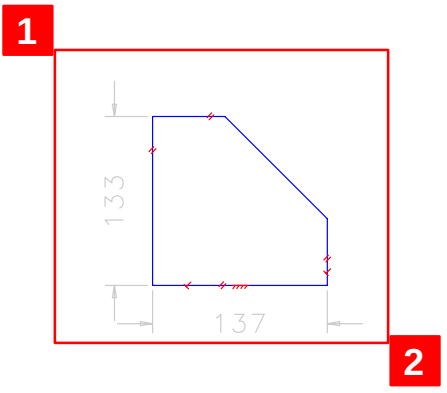
- anchor
- ground horizontal/vertical
- perpendicular
- parallel
- tangent
- coincident
- collinear

You can also use the *Delete* command to delete manually-created or software-created constraints.

So that you can sketch without using the Dynamic Navigator, delete the entire sketch before continuing.

1 click and hold the left mouse button down and drag a box around the sketch

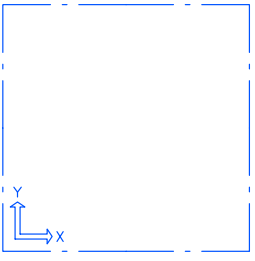
2 release the left mouse button



(Done)

(Yes)

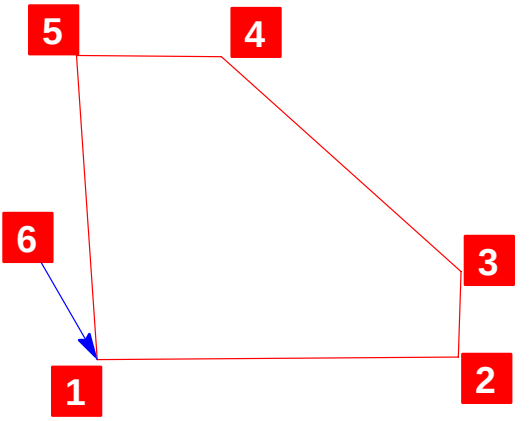
(to deactivate icon)



Temporarily turn off all Dynamic Navigator options by holding down the Control key while you sketch the same shape as before.

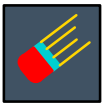
Warning!
Release the Control key just before the last point (6), so that the sketch will snap to the starting point.

Hold down the Control key and sketch.



If a constraint, such as parallel or perpendicular, is created on the last line, delete the constraint before continuing.

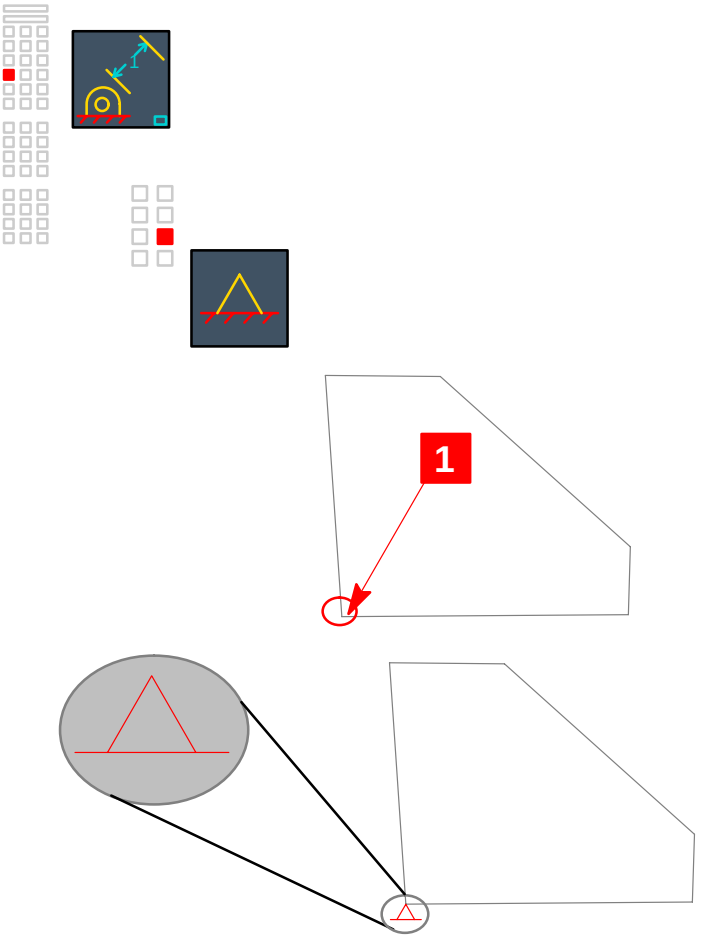
Hint



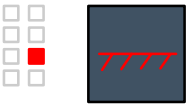
Check *I-DEAS Prompt*.
Make sure you are deleting the constraint and not the geometry.

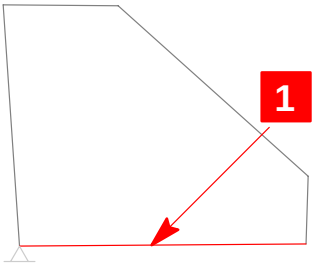
You can now use icons to create your own constraints.

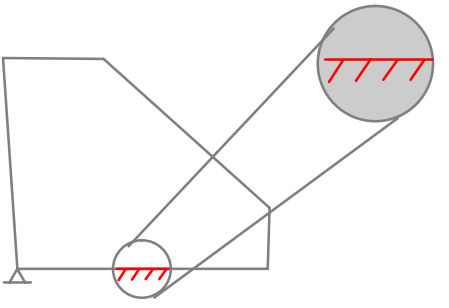
Anchor the first point.



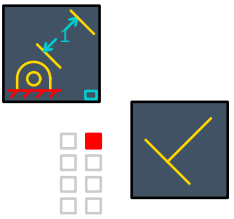
Ground the lower line horizontal.

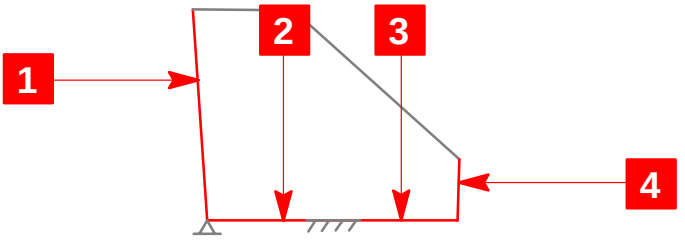


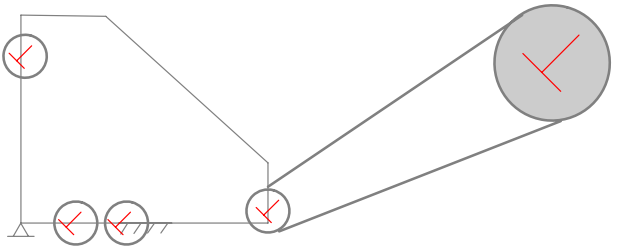




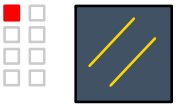
Create a perpendicular constraint between the two vertical lines and the grounded horizontal line.

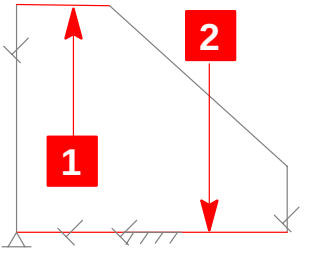


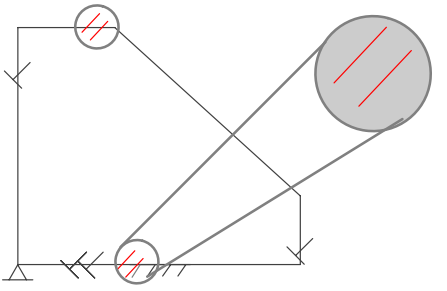




Create a parallel constraint between the top and bottom lines.

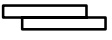






Close the *Constrain* panel by double-clicking in the upper left corner.

Recovery Point



File
Save

Tutorial wrap-up

You have completed the Sketching and Constraining tutorial.

Save the model file with this part. You'll use it in the next tutorial.